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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/556,491	04/21/2000	Scott E. Moore	MI22-1422	6392

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EXAMINER

THOMAS, DAVID B

ART UNIT PAPER NUMBER

3723

DATE MAILED: 10/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/556,491

Applicant(s)

MOORE ET AL.

Examiner

David B. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-42 and 53-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 58 is/are allowed.
- 6) ☒ Claim(s) 36-38, 40, 42, 53-56 and 59 is/are rejected.
- 7) ☒ Claim(s) 39, 41, 57 and 60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 36, 40, 42 and 59 are rejected under 35 U.S.C. 102(e) as being anticipated by Obeng et al. (6,048,256).

Obeng et al. ('256) disclose a semiconductor workpiece processing method comprising: providing a chemical-mechanical polishing semiconductor process chamber (the examiner notes that the process chamber recited by the applicant has no support as being a particular structure, and as such does not constitute a limitation in any patentable sense); supplying slurry to the semiconductor process chamber; and

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monitoring the turbidity of the slurry during the supplying using a sensor (Col. 5, lines 18-62).

3. Claims 36-38, 40, 42 and 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Adams et al. (5,755,614 and 5,664,990).

Adams et al. disclose a system for recycling slurry in a CMP apparatus. A semiconductor wafer (not shown in FIG. 2) is pressed against pad 11 and rotated by carrier 12, which is attached to shaft 21. Pad 11 rotates clockwise, as indicated by arrow 22, and carrier 12 rotates clockwise, as indicated by arrow 25. Slurry 31 flows onto pad 11 through dispensing tube 33 and flows radially outward over pad 11. A portion of slurry 31 is used to polish a wafer as the slurry flows over the pad (Col. 5, par. 6). From heat exchanger 49, recycled slurry flows through a plurality of sensors, such as pH sensor 51, temperature sensor 52, and conductivity sensor 53. Other sensors that might be appropriate for a particular application include a *turbidity sensor*, densitometer, ion-specific electrodes, voltammeter cells, infrared sensors, ultraviolet sensors, or visual sensors (Col. 6, par. 7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (5,755,614 and 5,664,990), as applied to claims 36-38, 40, 42, and 59 above, in view of Giuffre et al. (5,923,433).

Adams et al. (5,755,614 and 5,664,990) disclose the claimed invention except for disclosing the particulars of a turbidity sensor. Giuffre et al. ('433) disclose a turbidity sensor. Giuffre et al. ('433) teaches that the turbidity sensor has a sensing components package 58. The sensing components package 58 has a PC board 59 supporting a light emitter 61, a transmitted light detector 63 and additional physical probes 67 represented here by a conductivity probe surrounded at its base by an O-ring 69. The light emitter, in situ, abuts second sensor tube tab 39, while the light detector 63 abuts the first sensor tube tab 37. The physical probes 67 fit through through-holes 41 and 43 of the flow tube and are sealed by the O-rings 69 at their base. Other optical or physical sensors might be added as required. Additional electronic components necessary for sensor signal processing would typically be mounted on the PCB 59 but are not shown for the sake of simplicity. Input/output leads 71 provide external electric/electronic connection outside the sensor package. A spring clip 73 for attachment of outside cabling is further provided. Through-holes 75 in the PC board 59 are provided for cooperative engagement with the capture posts 55 of the overmolded casing 45. The turbidity sensor of Giuffre et al. ('433) provides the benefit of allowing a variety of different light, or electromagnetic radiation, sensors as well as physical sensors to be positioned on the sensor package 58 so as to surround or engage the flow tube in order to take a variety of different kinds of measurements on the media flowing therethrough

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(Col. 3, lines 52-67 and Col. 4, lines 1-9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the CMP slurry recycle and supply system of Adams et al. (5,755,614 and 5,664,990), when utilizing a turbidity sensor, by providing a turbidity sensor such as that of Giuffre et al. ('443), which utilizes electromagnetic energy, in order to monitor physical properties of the fluid flowing therethrough with a low cost sensor.

Allowable Subject Matter

6. Claims 39, 41, 57, and 60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 58 is allowed.

Response to Arguments

8. Applicant's arguments filed March 6, 2003 have been fully considered but they are not persuasive. Regarding the issue of the limitation "during the supplying" with respect to Obeng et al. (6,048,256), Obeng et al. clearly indicates in Col. 5, lines 18-37 that the system is a *continuous slurry delivery* system [emphasis added] and that the system may comprise a pre-mixing chamber 211 and a pre-dispensing chamber 212. Obeng et al. Further indicates that portions of the physical parameter sensing systems may be distributed as desired for optimum performance and that these sensors may be located on either the pre-mixing chamber 211 or the pre-dispensing chamber 212 (Col. 5, lines 18-37).

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9. Applicant's arguments with respect to claims 39, 41, and 53-57 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Thomas whose telephone number is (703) 308-4250. The examiner can normally be reached on 7-4 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J. Hail can be reached on (703) 308-2687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.



David B. Thomas
Patent Examiner
Art Unit 3723

dbt